

Non-native Fish Issues and Management in California

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Abstract- *Non-native fish introduced into California are categorized as either 1) purposeful legal introductions, 2) illegal introductions, or 3) unintentional introductions. Introduced fish include fish not native to California waters and introductions of native California fish to waters where they did not previously occur. Purposeful legal introductions include such species as a non-native largemouth bass (*Micropterus salmoides*) and native rainbow trout (*Oncorhynchus mykiss*). Purposeful illegal introductions include non-native northern pike, (*Esox lucius*) and native Sacramento pikeminnow (*Ptychocheilus grandis*). Unintentional introductions include species such as non-native bigscale logperch, (*Percina macrolepida*) and yellowfin goby (*Acanthogobius flavimanus*). Many fish introduced into California have developed naturalized populations and provide valuable recreational, social, and economic benefits (Lee 1995). Issues regarding introduced fish generally center around effects of introductions on native fish species (Moyle 1976, Moyle et al. 1995). Of the 49 fish species identified by the California Department of Fish and Game (CDFG) as "species of special concern", habitat alteration including dams, water diversions, land use practices, and pollution was identified as a problem leading to declines in populations for 45 species. Competition and predation from introduced fishes were identified as a contributing factor for 20 species (one anadromous game species, 19 nongame species). In most of these cases, habitat alteration that favored introduced species with resulting negative consequences for native species was often cited. Other factors cited included climatic variations, (drought, flood, and fire), loss of genetic integrity, and exploitation. Management of purposeful legal fish introductions includes CDFG protocols for new species introductions, policy statements, harvest regulations, habitat enhancement, and research and monitoring. Management of illegal and unintentional introductions includes laws and regulations governing importation and movement of fish, research and monitoring, eradication, public education, and punishment of violators.*

* Dennis chose to have only the abstract of his talk published in the Proceedings.